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Human Migration and Natural Resources: Implications for Land Managers and Challenges for Researchers

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Abstract

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Rural areas of the Pacific Northwest experienced a dramatic growth in population during the late 1980s to early 1990s. This growth was fueled by both push and pull factors, including environmental and natural resource-based amenities. Such growth has not only stressed the capacity of rural counties and communities to cope with change but also has raised important questions about interactions between people and natural resources. This paper, explores four fundamental components of this interaction: (1) the drivers of population growth; (2) the consequences of population growth, primarily for management of natural resources; (3) the potential changes in the social and psychological links between people and natural resources that may accompany rapid immigration; and (4) the best way to measure and assess the consequences of population growth in rural areas. Some fundamental propositions within each of these components are presented. We use examples from Kittitas County, Washington, to illustrate our discussion.

Keywords: Human migration, population growth, natural resource management, environmental amenities, social and environmental change, population dynamics.

Introduction

During summer 2000, wildfires raged through the Bitterroot National Forest, adjacent state-managed and private lands in Montana and nearby Idaho. The combination of a long and geographically extensive drought, decades of fuel accumulation, and dramatically low fuel moisture content had seasoned the forests of the northern Rocky Mountains for major conflagrations. The fact that fires occurred was not surprising, nor was the difficulty of immediate suppression particularly unexpected—fire managers in the Bitterroot Valley had already observed the rapid rate of spread and combustion of fuels during the spring prescribed burning season. Although the fire behavior in July and August was extreme, it was the presence of homes and communities that changed how the fires were fought. After ensuring human safety, firefighters were forced to first protect homes and communities rather than develop a direct attack on the fires themselves.

Although the fires—both those that occurred in the Bitterroot National Forest and other places, in 2000 and at other times—provide important lessons for both living in and managing rural-wildland interfaces, their effects, the management issues they entail, and resulting policy revision are symbolic of larger social changes occurring in the forest lands of the West. These changes are occurring at the same time that the accumulated effects of resource policy decisions (e.g., fire suppression and exclusion, timber harvesting, road construction) are becoming apparent. Although our ability to display those consequences (through spatial modeling, for example) has improved dramatically, our understanding of the social forces and processes leading to increased human populations and the implications of population growth in the rural-wildland interface is poorly developed, yet fundamental to its stewardship.

The growth of human populations in formerly wildland settings has brought dramatic changes in how people interact with natural and largely publicly administered forested environments. These changes are induced primarily by significant spatial shifts in the human population at both large and small scales. These shifts represent not only changes in the **amounts** of goods and services demanded from public forests, but also because of significant transformations in what people value, changes in the **character** of those goods and services, changes that are often at odds with both long-established notions of what “things” public lands deliver and with the management processes designed to deliver them. At the same time, the local presence of the USDA Forest Service and other land managing agencies has been changing. Rangers, once highly integrated into, and more in tune with, rural resource-based communities are now more frequently located in larger communities often removed from the forest. Ranger districts have been consolidated, and those that remain have fewer employees, less stability in leadership, and more competition for their time and attention.

These changes have converged with other growing challenges confronting public land managers (such as the hows and whys of public involvement, the appropriateness of various planning processes to the new realities of politicized and contentious settings, shifts in political power, continuing legislative scrutiny, etc.) and are producing a policy environment that is at once dynamic, difficult to understand and predict, yet increasingly salient to managers and citizens.

An important component of these social processes is the human population growth and change that has occurred in rural areas of the Pacific Northwest over the last 25 years, but particularly in the 1990s. Such population change has been dramatic, and the presence of homes in forested environments has somewhat surprised agencies managing nearby public lands. In this paper, we consider the natural resource management issues and questions prompted by this extraordinary growth in human

population at the interface of wildland and urban environments. Our overall goal is not only to describe the complexity of these challenges but to stimulate research and deliberation about the interface. The paper begins with an overview of population change, focusing on the Pacific Northwest and the interior Columbia basin. We consider a series of questions concerning explanations for such change, how these relate to natural resources, and the potential consequences of change to management. We then discuss how the links between people and natural resources may be changing. We conclude with some considerations of important measurement questions concerning population growth. Research in this area is limited, so our discussion is focused on presenting a series of propositions. We present examples from Kittitas County, Washington, to examine the drivers of population growth and its implications for natural resource management.

Human Migration and Population Change: New Challenges for Natural Resource Managers

The 1990s brought patterns of human migration to the Pacific Northwest not experienced in the recent past. Although the 1970s had undergone a “rural renaissance” in urban-proximate counties in terms of population growth, the 1990s brought a more widespread change in population, at least in the Pacific Northwest, that was not limited to urban-proximate counties, and that extended into forested areas unlike earlier growth patterns. For example, 94 of the 100 counties (only 6 of which have been classified as “metropolitan”) in the interior Columbia basin (encompassing Oregon and Washington east of the Cascade crest, all of Idaho, western Montana, and minor parts of Nevada and Utah) experienced increases in population from 1990 to 1994 (McCool et al. 1997). In particular, counties high in natural resource-based amenity values (e.g., forested mountains, rivers, and lakes; access to recreational settings for fishing, hiking, camping, river floating, etc., and the presence of clean air and water) and havens for retirement (such as Deschutes County, Oregon, and Ravalli County, Montana) demonstrated dramatic increases in population throughout the 1990s with the majority of this owing to net immigration. These trends may become more remarkable in the future as the baby boom generation approaches and enters retirement, which will begin to occur in about 5 years. About 31.1 million Americans were age 65 years and older (the most popular retirement age) in 1990. This number is projected to increase by more than 25 percent to 39.7 million by 2010 (USDC Bureau of the Census 1999).

Prior to the 1970s, migration was driven mainly by either economic factors or interest in being near family. In the 1970s, however, the back-to-the-land movement resulted in migrants who were younger, made fewer demands for services, and often had little money. The presence of natural resource-based amenities as pull factors and deteriorating urban conditions as push factors helped change the fundamental forces influencing migration—as predicted by Ullman (1954). Although economic opportunity may be important, amenities have also significantly increased. Preferences for small, rural community settings as a residence may predominate in American society (Fuguitt and Brown 1990, Fuguitt and Zuiches 1975, Zuiches 1980). Migrants may be drawn by cheaper housing, lower crime rates, and a slower pace of life often found in rural communities. They also may be attracted to natural resource-based amenities. Several studies of migrants and migration patterns suggest an increasing significance for such amenities in migration decisions (e.g., Haas and Serow 1997). McGranahan (1999) reports that environmental amenities—such as climate, topography, and water—were highly correlated with rural county population growth from 1970 to 1996. Research also has shown that the presence of national parks and designated wilderness often is

associated with higher than average population growth (Rudzitis and Johansen 1989). Johnson and Beale (1998: 24) summarize this trend by stating:

It was this desire for a retreat from big-city strains and hazards, the desire to enjoy nature and live in a community where one can be known and make a difference, that made the suburbs grow, and now that technological and economic change allow, it may continue to benefit rural areas.

These preferences also can be seen in net migration figures for counties classified as recreational by the Economic Research Service (Beale and Johnson 1998). Such counties have higher than average expenditures on amusement, recreation, and lodging. In the 24 counties classified as recreation counties in the interior Columbia basin, for example, net immigration accounted for an average of 80 percent of the total population growth from 1990 through 1994 (McCool et al. 1997). Such patterns are not limited to the basin: Johnson and Beale (1998) report that 94 percent of the counties in the United States with 30 percent or more of their land in federal management saw population growth, and for most, net immigration was an important factor.

This rapid rate of population growth, owing primarily to migration, has perhaps strengthened the economic viability of some communities through increased spending, enhanced employment opportunities, and a growing tax base, but it also has dramatically stressed the capacity of rural counties (and rural regions of more urban counties) to provide needed services. Because newcomers may bring political savvy, new expectations, and diverse values with them (Brown 1995, Schwartzweller 1979), conflict and controversy frequently occur over provision of local government services. An important characteristic of this growth is the changing ethnic and racial character of the population. Minority populations (Native Americans, Asian-Pacific Islanders, and Hispanics) in the Pacific Northwest are growing rapidly and bringing with them different perceptions of what goods and services public lands should produce.

Growing populations also can create new economic opportunities for the resident population, thus potentially reducing outmigration. In a sense, a growing population that is more diverse suggests new and unanticipated ways of interacting with natural resources. Conflicts in value systems between traditional commodity interests and those seeking venues for special forest products, for example, may exacerbate the potential for friction over natural resource management.

As well, the volatility of rural populations suggests potential instability in agency relations with adjacent landowners and communities. This volatility comes from both immigration and outmigration, which on average in the Pacific Northwest involves about 20 percent of a county's population, each year. Eventually, long-term residents do not represent the community anymore as a majority of the residents in any county will be relative newcomers, a group Amato and Radzilowski (1999) refer to as "a community of strangers." There are important implications for not only new expectations by ones who may or may not be informed about natural resources and how they are managed but also challenges for developing good relations between management agencies and their local publics. For example, with such volatility in a population (often accompanied by turnover within agencies), it is difficult to maintain the long-term interactions often necessary to the mutual learning and understanding that serves as a foundation for informed public judgment. Rural communities are becoming increasingly integrated into regional, national, and international economies and increasingly less internally interconnected (Berry 2000).

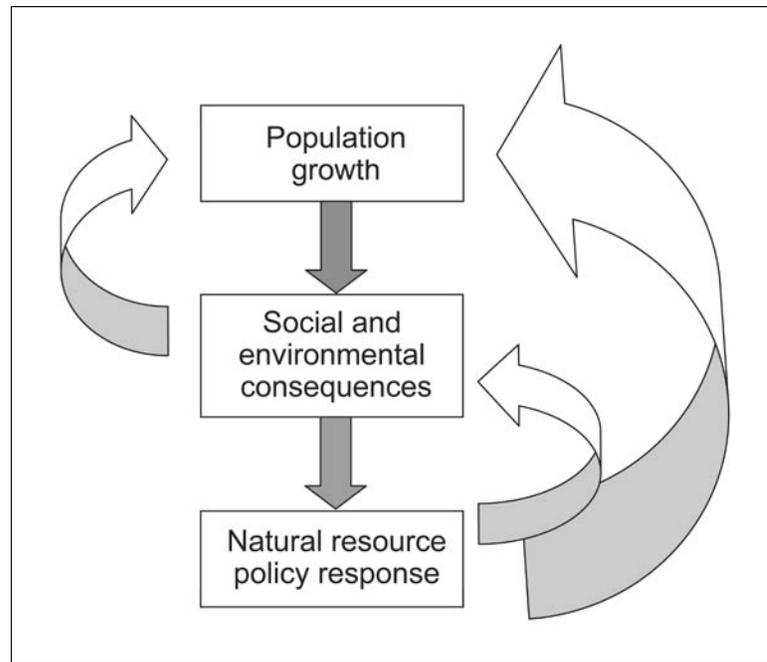


Figure 1—Conceptualization of the links between population growth and natural resources management. Feedback from the policy response may affect immigration and outmigration as well as the magnitude of the social and environmental consequences through actions that dampen or enhance effects.

Human Population Growth and Natural Resources Management: Policy Questions and Research Challenges

Population Growth Driver Questions

The links between population growth and natural resources may be visualized as shown in figure 1. Questions derived from these links may be roughly divided into four components: population growth drivers, growth consequences, social and psychological links with natural resources, and measurement. For each of these components, we identify a major proposition (shown in bold) and a set of questions. Following our discussion of the propositions, we will use the Kittitas County example to illustrate the nature of each issue.

Fundamental to understanding the implications for natural resources is a better comprehension of the drivers of population growth, particularly growth occurring as a result of net immigration. Frey (1993) and Frey and Speare (1992) identify three major conceptual frameworks for explaining migration patterns: period, regional restructuring, and deconcentration. Of the three, Troy (1998) argues that deconcentration combined with period explanations are effective in understanding the migration patterns of the 1990s. Migration has both push and pull factors—those attributes that serve, respectively, to encourage people to move out of an area and those attracting people to an area. Many demographic studies have emphasized the role of economic pull factors, such as growth, job availability, and high wages, while ignoring important amenity-based pull factors—such as the presence of wilderness, forests, mountains, lakes, clean air, pure water, and recreational opportunities. Economists often refer to these amenity-based factors as “public resources.” These pull factors operate in concert with certain push factors, such as urban decay, pollution, crime, and the cost of housing, to make rural environments appear attractive.

Proposition 1a. Amenities are increasing in importance as a fundamental reason for immigration to rural areas. Several studies have documented a strong American preference for living in rural settings as discussed earlier. Small rural towns are often viewed as crime free and as being reservoirs of fundamentally American values. A nostalgic notion of quality of life in rural towns may underlie these preferences. Although many people prefer to live in rural towns, in the past, these preferences have been tempered by needs for access to larger communities and the jobs, services, and opportunities they afford (De Jong 1977, Fuguitt and Zuiches 1975). These limitations may have less impact today as telecommunications technology permits access to many business services regardless of where one lives. Transfer payments to individuals (in the form of retirement, interest, and social security) allow increasing flexibility in choice of residential location.

With the U.S. economy in excellent condition for nearly a decade and the rise of knowledge-based industries, more people may be able to express their preferences for living environments through migration. Much of the migration in the 1970s was into rural counties adjacent to cities, but the 1990s migration has involved more geographically isolated locations as well (Troy 1998). This change suggests that the relative advantage of suburbs may be declining in comparison to the quality of life and availability of services in rural America.

Proposition 1b. Public lands offer the environmental-based amenities that rural immigrants seek. We need to better understand the role of wildland settings and national forests, and national parks as pull forces. Despite the controversy over commodity extraction from public lands, these lands offer recreational opportunities, scenic vistas, solitude, and relatively unmodified environments that many people seek to live in or near. Yet, these factors, although increasingly important, may be viable only when acting in concert with other pull forces. We need to better understand how these environmental pull forces interact with other factors, such as highways, airports, cellular phones, and T1 lines for high speed Internet access that are not as well developed in rural areas. What types of people are attracted to these environments? What values toward planning and natural resource management do they hold? How involved will they become in local politics? How do they perceive the role of the environment in their lives? How do their current perceptions compare to perceptions they held where they formerly resided?

What is the spatial distribution of population growth over time? We can map this growth by county, but it is perhaps more useful to know where—in terms of landform, vegetative cover, slope, or distance to a highway, park, or other recreation site—this growth is occurring than to know the particular administrative unit it is occurring in. Such information would help land managers better understand and predict the location of residential developments, particularly large-scale developments that might eventually affect publicly administered resources through a number of offsite effects.

Proposition 1c. “Hidden” people (primarily Hispanics in agricultural regions and Southeast Asians who migrate seasonally for mushrooms and other non-timber forest products of the Pacific Northwest) may have different demands for public services and may interact with natural resources in fundamentally different ways than the resident population. Migration figures may miss important segments of the population, such as migrant workers who may be in the country illegally, undocumented workers, or others who are always on the move with no

permanent address. How are these components of the population accommodated in planning processes and accounted for in management decisions? How are their needs for goods and services from public lands accommodated? How are they differentially affected by resource management decisions? How do they interact with other residents? How are they perceived by other residents?

Growth Consequence Questions

The dilemma that rural population growth presents, particularly in rural, high-amenity settings, is challenging to planners. Graber (1974: 506) long ago noted that as rural areas grow in population and associated development, they begin to lose some of their desirable characteristics: “[The] more people there are that discover these charms and the greater the influx, the more the area begins to acquire urban characteristics.” Immigrants discover that the pace and change of the urban settings they attempted to escape seem to have arrived with them, and often, ironically, it is the expectations they bring that result in rural communities taking on characteristics of more urban settings.

Proposition 2a. Immigrants will increasingly locate in forest-dominated settings at the wildland-urban interface. When rapid growth occurs, the market responds through increased supply of housing and residential lots. Where does this growth occur? How do we describe growth at smaller scales? Does it occur on the fringe of existing urban areas and rural villages, or do new developments occur at the fringe of wildlands? What about in-fill incentives? What services are existing governments willing to provide and at what cost? How do new houses and lots differ from existing houses and lots?

What impacts do new developments have on such important issues as forest health, access to federally administered lands, riparian management and water quality, forest and wildlife habitat fragmentation, fire suppression, and use of fire as a management tool? In the Kalispell, Montana, area, game wardens killed nine mountain lions that wandered into new suburban-style developments in a 5-month period in 1998. The image of mountain lions “patrolling” streets in search of food is not generally consistent with a migrant’s notion of a safe rural lifestyle nor a wildlife manager’s view of ideal game management.

The transition from large ranch and farm ownerships to small subdivisions, ranchettes and hobby farms, means increased difficulty in administration for counties that must maintain roads; for school districts that must bus students or build new schools; for rural fire districts that must carefully review subdivision plans and provide fire protection services with fewer volunteers to staff the fire trucks and ambulances; and for public land management agencies that must deal with the consequences of land fragmentation and increasing demands for various types of recreation.

Proposition 2b. Inmigration at the wildland-urban interface has important implications for management of forest lands, including not only the social and political acceptability of proposed management actions but also the processes used to develop management plans. What responsibility do public land managers have in sustaining the natural resource qualities that have brought people to an area? What role do agencies play in sustaining quality of life in communities in light of increasingly rapid growth and change? Do immigrants enhance or retard economic development and tax revenues? Do they oppose or support property tax reform, bonds for schools, libraries, etc.?

The land management objectives held by new property owners may lead to different ways of managing a particular piece of land and changes in how adjacent federally administered land itself is managed. Understanding what these changes are and how they might affect management is critical to development of land management plans. Migrants, especially retirees and those maintaining home offices, have time during the day to meet with agencies. They also feel more comfortable with planning regulations, environmental impact statement documents, and public meetings, and may have a better understanding of how to influence planning processes. This raises issues for land managers because they may find collaboration and public involvement easier with newer migrants than long-term residents. At the same time, these newer residents may bring with them political skills and savvy developed and practiced in more urbanized settings, potentially overwhelming long-established interaction processes.

A potentially more significant question, however, concerns how management plans are implemented in a dynamic social context; for example, increases in the number of lots adjacent to a national forest may eliminate the possibility of using fire as a management tool simply because the perceived risk (when a fire escapes) becomes too high. Do newcomers realize that to keep land from being subdivided or small towns from turning into bedroom communities, they need to keep traditional resource economies viable? The Mountains to Sound Greenway Trust based in Seattle attempts to promote and maintain the Interstate 90 corridor running east from Seattle as a “working landscape” retaining active management of the land in a way that is sensitive to aesthetic values and historical land uses.

Proposition 2c. Lifestyles of new residents may differ from those of existing residents, creating new and broader demands for recreational access and opportunity on adjacent public lands. Understanding such differences can help managers predict how demand might change in the future and assist them in developing appropriate responses. Are the demands of recent migrants similar to those of the long-time residents? For what opportunities are demands increasing or decreasing? What types of experiences do both residents and immigrants seek? How do new residents influence long-term residents and vice versa? To what extent are the experiences sought by both similar and different? Can management satisfy both with similar management approaches? Can a variety of opportunities be provided concurrently, or are some activities mutually exclusive?

Local governments are confronted with a somewhat different set of questions. Can government provide services to newcomers coming in at levels seen over the last decade without concurrent industrial development that has previously provided funding for schools? Using education as an example, if 2,000 households with 3,000 school-age children move into a rural town, where does the \$9 to \$10 million needed annually for elementary and secondary education come from? The amount of property taxes paid by residential homeowners generally does not cover the cost of government services provided, including education. Bond issues for schools and other improvements may have difficulty passing as newcomers try to escape increasing taxes while long-time residents resent shouldering a burden they see brought on by newcomers. Developers may be asked to pay higher upfront costs. This would, in turn, raise the cost of a new house to the buyer. Year-round classes are being suggested as a partial solution by some school districts. (What effect might this have on demands for recreational opportunities?) In many situations, there is interest in developing new commercial and industrial complexes to generate tax revenue needed to provide government services and provide additional local jobs.

There also are questions concerning management of population growth, a contentious topic that many hesitate to even mention. Growth management acts and related zoning are based on the assumption that this growth should be controlled, limited, or influenced. What tools are available, and how is the choice of tools influenced by the institutional context? With rising land values, increased profits, and higher stakes, what is the capacity of rural villages to manage growth, especially when county commissioners see growth as not only a goal but the sole means of addressing funding issues? What zoning, or lack thereof, encourages growth in one place and not in another or encourages one type of growth and not another? Some local governments have addressed this issue through moratoriums, particularly when water is a limiting factor. What role do public land managing agencies have in the growth management debate? Should management occur at larger scales—such as the Oregon example (state land use zoning) or Washington’s 1990 Growth Management Act—or at smaller scales? What are the costs (including hidden costs) of subdivision?

Fortmann and Kusel (1990) argue that newcomers may hold a repertoire of useful political activism and organizational skills that provide a voice for concerns about environmental and natural resource issues held by oldtimers. These skills can provide the community as a whole with the option to express concerns that once were unspoken owing to a lack of venue or skill. On the other hand, some newcomers may be escaping from the political pressures, pace, and congestion of urban life and thus choose to live in communities that are gated and walled in more ways than one. Do these loners eventually become active in the community? Research is needed to better understand how newcomers are integrated into the community and what effects migration has on community capacity and resiliency.

Social and Psychological Questions Concerning Natural Resources

Proposition 3a. Those who move into rural areas are different in some ways than both those who remain in urban regions and long-term residents of rural areas. Because migrants are more likely to reside initially in metropolitan areas (where most of the population lives), there is an urban oriented or based culture in this group. For example, Graber (1974) established that migrants have higher levels of educational attainment than those living in the destination, a finding reinforced more recently by Smith and Krannich (1998). Troy (1998) found that migrants to a 100-county area in the Pacific Northwest had smaller household incomes than nonmigrants in the destination area. The fundamental question, however, is not so much about identifying differences in income and education between newcomers and oldtimers: it is more about understanding what these differences mean for managing the public estate.

Proposition 3b. There are important and meaningful differences between recent immigrants and long-time residents of rural areas in relation to how they interact with the environment and how they value different components of it. Many questions confront researchers and managers in this area. For example, how do newcomers versus oldtimers perceive the environment? Is the last settler syndrome operative in the type of growth situation seen in the West? Do attitudes toward management policy shift according to tenure within a county? Could a typology of lifestyles be depicted that would better describe human interactions with the natural environment?

Much has been written about the potential for conflict among those traditionally living in rural counties of the West—farmers, ranchers, loggers, miners—and the exurbanite who brings a substantially different orientation toward the environment. Alm and Witt (1996: 26) summarize this potential: “. . . there exists a deep historical conflict among competing values that has resulted in an ‘us against them,’ orientation where farmers,

ranchers, loggers and miners view themselves as under siege from the new urban-driven environmentalists.” Much of this potential for conflict, they argue, focuses on quality-of-life issues. In high-amenity areas, quality of life deals directly with amenities such as public lands, clean air, pure water, forests, scenic vistas, and wildlife. Many newer migrants and visitors place higher importance on aesthetic values and recreation while potentially lacking the historical and cultural connection to a working landscape characteristic of farmers, ranchers, and loggers.

A study of small-woodlot owners in southern Oregon, found that 60 percent of the long-term residents had utilitarian views of landscapes, whereas 75 percent of the newer migrants had environmental views. In contrast, Smith and Krannich (1998) in a study of six rapid-growth communities in Utah and Wyoming found few differences between newcomers and oldtimers in attitudes toward public land management. This finding reinforces that of Fortmann and Kusel (1990) who also found few differences. Are, as the latter authors suggest, newcomers simply expressing attitudes and preferences that have laid dormant in rural communities until their arrival, or have these studies missed some important and relevant measures? This potential value pluralism lays the foundation for not only conflict over natural resources but the acceptability of the processes used to resolve such conflicts.

Perceptions of differences in attitudes remain important, however, and influence the social discourse over public land management, even where such differences may be small and inconsequential (Smith and Krannich 1998). If differences are perceived where none exist, then unnecessary conflict and controversy can arise and impede resolution of socially significant questions. In light of such situations, public land managers need to be alert to the presence of conflict based on invalid assumptions about differences between newcomers and oldtimers.

Proposition 3c. Newcomers and oldtimers differ in how they are attached to their residence. Another set of questions deals with the concept of place attachment. How strongly are migrants attached to places, and how do they define those places? Some data suggest that place attachment does not differ with tenure, but other data allow us to speculate that the nature of place attachment differs between the newcomer and oldtimer (Martin and McCool 1994). For the oldtimer, place attachment may be defined in terms of the network of friendship and family links for which small rural communities are known. Oldtimers also may be more attached to specific locations, places with fond memories of life events and meaningful experiences. Newcomers may be more attached to amenities in general and not so deeply embedded in the local social and political system or tied to specific places on the landscape. Their attachment to physical amenities may place them at odds with the local population or, given the findings of Smith and Krannich (1998), may serve to raise awareness and political activism levels.

Proposition 3d. When attachments to physical attributes of place are identified, oldtimers may define such attachments in purely functional terms (a good place to hunt and fish), whereas newcomers may reveal more aesthetic and symbolic definitions (a pretty landscape; a place of personal restoration). Differences in place definitions are often the cause of conflict over public land management (Grieder and Garkovich 1994), but research has yet to map the differences in place definitions between newcomers and oldtimers. Do we see one group exhibiting a utilitarian definition or another a more symbolic or cultural one? Tremblay and Dunlap (1978) found that urban residents (and presumably people migrating from

urban areas) were more symbolic in their views of the environment, whereas rural residents had more utilitarian perspectives. Although oldtimers often define a place in terms of a working landscape and an integral part of the local economy, newcomers may define the same landscape as natural refugia, a pristine natural area, or prime recreation site. They also found that years of residence to be a more powerful predictor of environmentalism than any other factor. How are these definitions distributed among the population?

What is important about potential differences in place definitions and attachments is that their sources are significantly different environmental symbols, and such differences may serve different functions for the individual. For example, the exurbanite moving to a rural area may, as we have suggested above, hold attachments based on aesthetics rather than instrumental or utilitarian perceptions. But these differences may reflect different functions: the aesthetic attachment may potentially reflect a quality of life function that the newcomer seeks, whereas the utilitarian attachment may signal more of a working or income-supporting function. Such differences may be difficult to sort out during a conflict, yet are fundamental to it.

Is the newcomer population only superficially attached to place and willing to move when conditions turn adverse? (Jobes 2000) For example, Jobes reports some evidence of rapid turnover in the newcomer population in Gallatin County, Montana, when the full force of Montana winters was realized.

What about the nature of definitions of place? Who defines a place? The Chamber of Commerce? Residents? The Forest Service? Tourists? In all likelihood, each has a distinctive definition, and thus the important question is the extent to which such definitions are shared and which definitions may be marginalized and by whom. Place imagery and the meanings people attribute to a place shape their understanding of the community and become part of their own personal identity (Fitchen 1991). No wonder oldtimers become irate when some upstart newcomers try to redefine the image of a place.

Proposition 3e. Attachments to place occur at various scales and intensities and are of different types. How does place attachment differ with scale? Migration into a community may change attachments at one scale but not at another. For example, new migrants may become attached to their new neighborhood but retain their attachment to their old community where their job and long-time friends are located. On the other hand, they may maintain their attachment to their old neighborhood while becoming more attached to their new community through memberships in organizations and involvement in activities. How does this affect who will take an interest and become involved in local resource decisions? How will agencies identify, locate, and communicate with interested parties?

Uncertainty pervades our understanding of the effects of high migration into interface communities. The effects on social capital and community capacity and resilience may differ from community to community because of many influences, such as the presence and distribution of organizational skills, leadership, and political power. We should not expect all communities to respond similarly (Krannich and Greider 1984) to migration. One important consideration will be how well newcomers are integrated into community life and whether their involvement creates new political power and structures so rapidly that they cannot be absorbed into the community, resulting in instability and new conflict.

Measurement Issues

The above issues need to be conceptually mapped, and eventually variables also will need to be identified and measured. Issues surrounding the measurement of migration continue to challenge researchers. Most migration is reported as movement from one political unit to another, say county to county or state to state. Migration also is measured over a period of 5 to 10 years, missing seasonal migration and those who move but return again within a few years.

Despite the findings of Smith and Krannich (1998) and Fortmann and Kusel (1990), important questions about potential differences between newcomers and oldtimers remain. The nonsignificant findings are in distinct contrast to anecdotal evidence. Perhaps other variables, such as lifestyle orientation, need to be measured. Perhaps the variables previously measured were too broad or vague (i.e., we assume that everyone likes apple pie, but then find that some people strongly dislike it). Perhaps variables that might demonstrate differences have not yet been measured.

Proposition 4a. Significant issues exist concerning the appropriate temporal and spatial scales for dealing with immigration questions. Many questions concern the scale at which variables are measured (King 1997, McCool and Troy 1998). What is the appropriate temporal, spatial, or social organizational scale for measuring population growth and migration patterns? What should be measured? How? What questions are best addressed at what scales? How is this information displayed in a manner useful to natural resource managers?

How are the costs (economic, environmental, and social) of population growth measured? How can we accurately measure growth? What about people with two residences: How are they accounted for? What about part-time residents, those who live in quasi-residential campgrounds in campers and trailers during summer, and transient but frequent visitors such as pickers and gatherers who repeatedly frequent an area to gather mushrooms, ferns, bear grass, and other nontimber forest products, and visitors and owners of time-share properties? How are they and their views, values, and impacts accounted for? How are these groups of people included in decisionmaking processes?

Proposition 4b. New geographic analysis and imagery technologies can help in locating, identifying, and assessing consequences of development at the wild-land-urban interface. These technologies include geographic information systems and the widespread, and increasingly inexpensive, availability of satellite imagery in digital form. These technologies can help identify where development is occurring, provide the basis for predictive modeling, and assist in inventing new ways of measuring impacts. Impacts to habitats and vegetation are important consequences of development. What is a good measure of forest fragmentation? How much fragmentation is acceptable, given certain forest and ecosystem management objectives? How do managers perceive fragmentation? How do various segments of the public perceive fragmentation?

One objective of measurement is to aid in predicting consequences and relations. Can we predict which counties will rapidly grow from immigration? How could counties be classified to aid in understanding and prediction? The Economic Research Service (Johnson and Beale 1992) has developed typologies of counties based on "policies" and economic base. For example, any county with more than 30 percent of its land in federal ownership is defined as a federal land policy type. Troy (1998) developed

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a typology empirically based on migration patterns identified in Internal Revenue Service (IRS) county-to-county migration files. Which typology seems to work best for what purpose? How can we best use these typologies to help land managers?

The population growth and migration patterns exhibited in Kittitas County are, to a great extent, representative of trends and processes occurring across the West. Kittitas County thus presents a microcosm of larger social and demographic processes. The county is confronted with several intricate, linked, and complex issues and questions that also face other high-amenity, rural counties. Kittitas County is a lightly populated rural county located immediately east of King County and the Seattle, Washington, metropolitan area (fig. 2). It includes the forested east slope of the Cascade Range, irrigated and dryland agricultural areas in the midcounty and typical arid basaltic landscapes of the interior Columbia basin in the eastern part of the county. Federal land management agencies manage about one-third of the land base, primarily located in the western region of the county.

For most of its recent history, it has been heavily dependent on natural resource commodity production for its economic base. Such commodities have included agriculture, coal, and timber. The county lies astride Interstate 90, a major cross-country arterial, which connects to Interstate 82 from the east. The Burlington Northern railroad also bisects the county. The population in 2000 was 33,362, representing a nearly 25-percent increase from 1990.

Migration patterns characterizing Kittitas County have mirrored those presented earlier. In 2000, about 35 percent of the county residents had lived there 5 years or less (USDC Bureau of the Census 2002). A similar percentage of the population residing in the county during that timeframe has since moved elsewhere. Net immigration accounted for 86 percent of the population growth between 1990 and 1999. Troy (1998), in her study of human migration patterns in the interior Columbia basin, indicated that the county was one of five “recent growth” counties that demonstrated significant changes in migration patterns in the last 18 years. These counties had experienced net outmigration through the late 1980s, but subsequently have experienced net immigration.

We note that our discussion has dealt with net rates of immigration. Regardless of whether the net rate is positive or negative, IRS migration data show that the movement into and out of the county has been significant over the years. The IRS migration data also show changes in the residence of taxpayers from year to year and include dependents. Such data may not show the actual location of those dependents, however—some of which may be attending college, for example, in another county. Kittitas County contains a university campus, so the IRS data may not accurately reflect the contribution of students who are legal dependents of parents living elsewhere. The migration trends (see fig. 3) show volatility in the population, in terms of people moving in and out of the county, but an increase in immigration. The IRS data on migration show that there was net outmigration from 1980 through 1987, but this turned around in 1988, with net immigration occurring every year since (except for 1998).

In 1980–81, although net migration was only a minus 25 or so households, immigration totaled about 1,100 households, and outmigration only a little more. Thus, in one year the county had a turnover of about 2,500 households out of about 10,000 located in the county at the time. In 1998–99, over 2,300 households moved into or out of the county. Such figures emphasize the importance of examining both immigration and outmigration streams, rather than relying on net migration figures. This expanded



Figure 2—Kittitas County is located immediately east of the greater Seattle–King County area astride Interstate 90.

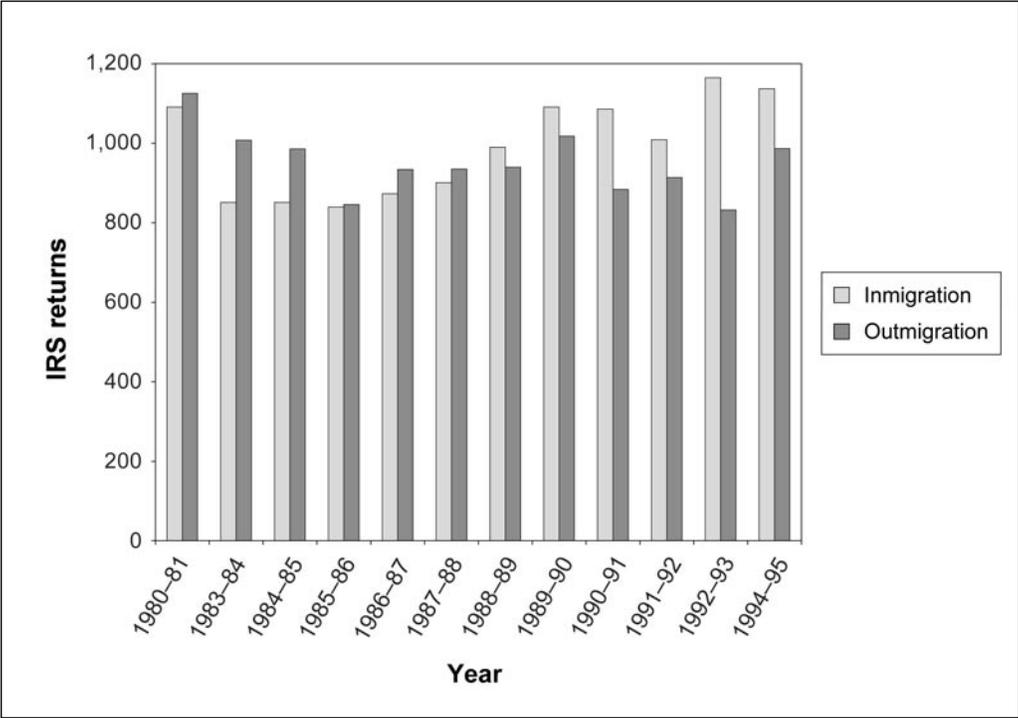


Figure 3—Immigration to Kittitas County has outpaced outmigration for the last several years as shown by the difference in Internal Revenue Service (IRS) returns of filers moving in and out. (Source information is from county-to-county migration files and the IRS.)

examination is particularly important in understanding the dynamics of population change in smaller communities and the implications mentioned earlier for land management.

Inmigrants to Kittitas County are primarily from other places within Washington. In 1994–95, about three-quarters of the inmigrants relocated from within Washington, with the five highest county sources accounting for about 50 percent of the total inmigrants. King County (Seattle) dominates this pattern, as it has for all years for which data are available. The proportion of inmigrants coming to Kittitas County from King County has ranged from 20 to over 34 percent each year. This proportion has gradually increased over time, although there has been year-to-year variability. If the current pace of growth in King County continues, much of rural King County will reach its 20-year growth target in less than 10 years (some areas in as few as 4 years), thereby suggesting even higher future rates of migration to surrounding counties.

Both push and pull factors account for this migration pattern. Push factors include crime, urban decay and congestion, and housing costs. About 25 percent of total moves in the United States are related to jobs and school (USDC Bureau of the Census 1997), with the remainder motivated by family, better homes, housing costs, and so on. Housing costs likely are a major factor in migration decisions in Kittitas County, because such costs are significantly lower there than in King County.

In contrast to Kittitas County, few new homes in King County are affordable for a middle-income family. Both the 1990 and 2000 censuses showed sharp and growing differences in housing costs between King and Kittitas Counties. In 1990, the average monthly cost for the former was \$876 and the latter at \$539. By 2000, the average monthly cost in Kittitas County had increased to \$978, while in King County it rose to \$1,514. According to the Washington Association of Realtors, the median home price in King County in early 1998 was \$192,300 (Clutter 1998). In comparison, the median price for a house in Kittitas County was \$78,800 (Clutter 1998). This difference may lessen as demand for housing in Kittitas County increases, resulting in higher housing prices. The forested, mountainous low-population-density environment of western Kittitas County also may be attractive to those wishing to escape from metropolitan King County.

The growing population of King County, accompanied by increasing housing costs, congestion, and pollution, suggests that some King County residents may choose to find new places to live while retaining jobs in the Seattle area. Other migrants will find local jobs hard to come by and will opt to commute as well. Thus, many of the new inmigrants in Kittitas County are likely to be commuters going to the Seattle area, even though 3,022-foot Snoqualmie Pass separates the two areas and often makes the winter commute hazardous. The commute from Kittitas County into the immediate Seattle area takes between 60 and 90 minutes, similar to the commute found in other large metropolitan areas. The 2000 census reported an average commuting time for people living in King County of 26.5 minutes, a figure that likely has increased as surrounding suburbs have developed. About 16 percent of the workers in Kittitas County in 1990 commuted to work outside the county (USDC Bureau of the Census 2002). Although this figure is far below the national average for rural counties (Aldrich et al. 1998), the 2000 census likely will indicate a far larger figure, given the recent influx of migrants from King County.

More and more people are willing to commute longer distances to work so that they can live in a pleasing environment, afford housing, avoid crime, or have access to recreational opportunities. Kittitas County has large, private forested tracts of relatively level land, ideal for residential development. New large-scale residential developments in Kittitas County, such as Trendwest's MountainStar Resort Community (an urbanlike planned development that would add between 3,000 and 4,000 permanent and vacation housing units) planned for the western part of the county, count on natural resource-based amenities as a major factor in marketing. This project, covering over 6,000 acres, will significantly increase the county's population and increase the demand for public services including water. Given the outdoors orientation of the development, demand for recreational opportunities in the adjacent Mount Baker-Snoqualmie and Wenatchee National Forests inevitably will increase. The stimulus effects of the development on the local social and natural resource environment resulting from spending by new residents and the estimated 1,600 new employees are not known.

In Kittitas County, what impacts will the Trendwest developments have on place definition? How do current residents see this project as affecting their sense of place? How do the potential residents of the project see it and the nearby communities of Roslyn and Ronald in terms of place? Will Roslyn's main street (familiar to many as Cicely, Alaska, in the television show "Northern Exposure") become the boutique for Trendwest residents and time-share owners? If so, does it matter, and to whom? Are large-scale projects, such as the MountainStar Resort, the most efficient methods of managing growth, or will invisible consequences appear decades later? Large-scale projects may be efficient, particularly in terms of waste treatment and internal transportation, but do they bring with them the potential for social class conflicts? For example, the 2000 median household income in Kittitas County was \$32,546 in distinct contrast to the \$53,157 figure for King County. Those moving into Kittitas County likely will be more affluent than the average current resident. The disparity in wealth will be displayed in various ways and will likely cause social conflict linked to obvious differences in wealth. Some long-time residents resent the newcomers, referred to as "coasties" or "206ers" (the latter a reference to the Seattle area code). How easily newcomers assimilate into local communities may depend on how involved they become in local community activities.

Conclusions

Rapid population growth in high-amenity rural areas, owing almost entirely to net immigration, carries many consequences of significance to residents, visitors, community leaders, and federal land managers. Understanding patterns of migration, the driving forces behind it, and the consequences of rapid population growth are critical to land managers. For example, simply understanding that the people moving in are different from those moving out may help managers prepare for additional or changing demand for recreational opportunities. Such understanding may help managers better understand why there seems to be a lack of cohesiveness in community voice about forest management.

Fuguitt and Beale (1996: 170) concluded their assessment of population migration trends by stating:

There is a segment of large-scale urban society, established in career experience and family life, that seems increasingly dissatisfied by the stresses and costs of megalopolitan and corporate life, drawn to outdoor amenities, and

fully mindful of the space-negating qualities of modern information and communications technology. These conditions seem to premise a further flow of people to attractive areas or even, where there are personal ties, to places of more average image.

Thus, we can expect questions and issues resulting from migration into high-amenity areas to be heightened in the future.

National forests and other public lands do not exist in isolation from the communities adjacent to them. Although national forests have a federal land management mission, they are impacted by shifts in local population and in addition must be responsive to community needs and desires. Understanding the questions posed above can lead to policies that more adequately integrate local and national interests. Inmigrants bring not only impacts directly related to the magnitude of population growth but also consequences that result from different values and ways of interacting with the environment and different expectations for public agency behavior in a planning setting. Understanding the questions driven by these changes is fundamental to increasing the efficacy of public land management.

Drivers of population growth in places like Kittitas County are predominately the result of combinations of factors such as comparatively lower housing and land prices in areas rich in natural amenities. As a result of several push and pull factors, populations increase, urbanization occurs, and some of the values inmigrants sought may be lost. Resource management increases in complexity as demands both rise and broaden, leading to more contentious decisions and greater political volatility. Although some may argue these are issues primarily for local governments, federal public land managers are inextricably drawn into them as they attempt to deal with natural hazards (such as fire and flood), meet legally mandated obligations (such as protecting or restoring threatened or endangered populations), and address the resource commodity needs of the Nation.

The potential for extreme value differences in how these objectives are met—and indeed what objectives should be pursued—is real, yet there is little understanding of what differences exist, what values and beliefs may be shared, and how might managers use this information. Moreover, managers are increasingly called on to make decisions at larger, “landscape-level” scales while having little understanding of both the ecological and social processes operating at those scales. The acceptability of those decisions will likely be increasingly challenged. Research can help make those decisions more informed.

Metric Equivalents

1 foot = 0.305 meter
1 acre = 0.40 hectare

Literature Cited

- Aldrich, L.; Beale, C.; Kassel, K. 1998.** Commuting and the economic functions of small towns and places. *Rural Development Perspectives*. 12(3): 26–31.
- Alm, L.R.; Witt, S. 1996.** The rural-urban environmental conflict in the American West: a four-state study. *Spectrum*. Fall: 26–36.
- Amato, J.A.; Radzilowski, J. 1999.** Community of strangers: change, turnover, turbulence and the transformation of a Midwestern country town. Marshall, MN: Crossings Press. 109 p.

- Beale, C.L.; Johnson, K.M. 1998.** The identification of recreational counties in nonmetropolitan areas of the USA. *Population Research and Policy Review*. 17: 37–53.
- Berry, E.H. 2000.** Review essay: rural sociology, migration, and community change. *Rural Sociology*. 65(4): 658–667.
- Brown, B.A. 1995.** In timber country: working people's stories of environmental conflict and urban flights. Philadelphia, PA: Temple University. 300 p.
- Clutter, S. 1998.** 85 miles: that's a commute. *Seattle Times*. February 16: Sec. A: 1 (col. 3-6), 13 (col. 1-6).
- De Jong, G.F. 1977.** Residential preferences and migration. *Demography*. 14(2): 169–178.
- Fitchen, J.M. 1991.** Endangered spaces, enduring places: change, identity and survival in rural America. Boulder, CO: Westview Press. 336 p.
- Fortmann, L.; Kusel, J. 1990.** New voices, old beliefs: forest environmental values among new and long-standing rural residents. *Rural Sociology*. 55(2): 214–232.
- Frey, W.H. 1993.** The new urban revival in the United States. *Urban Studies*. 30(4/5): 741–774.
- Frey, W.H.; Speare, A., Jr. 1992.** The revival of metropolitan population growth in the United States: an assessment of findings from the 1990 census. *Population and Development Review*. 18: 129–146.
- Fuguitt, G.V.; Beale, C.A. 1996.** Recent trends in nonmetropolitan migration: toward a new turnaround? *Growth and Change*. 27(2): 156–174.
- Fuguitt, G.V.; Brown, D.L. 1990.** Residential preferences and population redistribution: 1972–1988. *Demography*. 27: 589–600.
- Fuguitt, G.V.; Zuiches, J. 1975.** Residential preferences and population distribution. *Demography*. 12: 491–504.
- Graber, E.F. 1974.** Newcomers and oldtimers: growth and change in a mountain town. *Rural Sociology*. 39(4): 504–513.
- Greider, T.; Garkovich, L. 1994.** Landscapes: The social construction of nature and the environment. *Rural Sociology*. 59: 1–24.
- Haas, W.H., III; Serow, W.J. 1997.** Retirement migration decision making: life course mobility, sequencing of events, social ties and alternatives. *Journal of the Community Development Society*. 28(1): 116–130.
- Jobs, P.C. 2000.** Moving nearer to heaven: the illusions and dillusions of migrants to scenic rural places. Westport, CT: Praeger. 242 p.
- Johnson, K.M.; Beale, C.A. 1992.** The rural rebound. *American Demographics*. 17(7): 46–52.
- Johnson, K.M.; Beale, C.A. 1998.** The rural rebound (revival of rural America). *Wilson Quarterly*. 22(2): 16–27.
- King, G. 1997.** A solution to the ecological inference problem: restructuring individual behavior from aggregate data. Princeton, NJ: Princeton University Press. 346 p.

- Krannich, R.S.; Greider, T. 1984.** Personal well-being in rapid growth and stable communities: multiple indicators and contrasting results. *Rural Sociology*. 49(4): 541–552.
- Martin, S.R.; McCool, S.F. 1994.** Community attachment and attitudes toward tourism development. *Journal of Travel Research*. 32(3): 29–34.
- McCool, S.F.; Burchfield, J.; Allen, S. 1997.** Social assessment. In: Quigley, T.M.; Arbelbide, S.J., tech. eds. An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins. Gen. Tech. Rep. PNW-GTR-405. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station; U.S. Department of the Interior, Bureau of Land Management: 1871–2009. Chap. 7. Vol. 4. (Quigley, T.M., tech. ed.; The Interior Columbia Basin Ecosystem Management Project: scientific assessment).
- McCool, S.F.; Troy, L.R. 1998.** Estimating effects of natural resource policy: the impact of the ecological fallacy. Missoula, MT: School of Forestry, The University of Montana. 68 p.
- McGranahan, D.A. 1999.** Natural amenities drive rural population change. *Agric. Econ. Rep.* 781. Washington, DC: U.S. Department of Agriculture, Food and Rural Economics Division, Economic Research Service. 24 p.
- Rudzitis, G.; Johansen, H.E. 1989.** Migration into Western wilderness counties: causes and consequences. *Western Wildlands*. Spring: 19–23.
- Schwartzweller, H.K. 1979.** Migration and the changing rural scene. *Rural Sociology*. 44(1): 7–23.
- Smith, M.D.; Krannich, R.S. 1998.** Views toward public land management agencies in the Rocky Mountain West: Are there differences between newcomers and longer-term residents? *Proceedings of the 7th international symposium on society and resource management*. Columbia, MO: University of Missouri-Columbia: 78.
- Tremblay, K.R., Jr.; Dunlap, R.E. 1978.** Rural-urban residence and concern with environmental quality: a replication and extension. *Rural Sociology*. 43(Fall): 474–491.
- Troy, L.R. 1998.** Recent human migration to the interior Columbia basin and implications for natural resource management. Missoula, MT: School of Forestry, University of Montana. 71 p.
- Ullman, E.L. 1954.** Amenities as a factor in regional growth. *Geographical Review*. 44: 119–132.
- U.S. Department of Commerce, Bureau of the Census. 1997.** American housing survey for the United States: 1997. <http://www.census.gov/hhes/www/housing/ahs/ahs97>. (July 17, 2001).
- U.S. Department of Commerce, Bureau of the Census. 1999.** 1998 county population estimates. http://www.census.gov/population/estimates/county/co-98-1/98C1_53.txt. (July 17, 2001).
- U.S. Department of Commerce, Bureau of the Census. 2002.** 2000 census of population and housing. Washington, DC. <http://www.census.gov>. (September 18).

Zuiches, J.J. 1980. Residential preferences in migration theory. In: Brown, D.L.; Wardwell, J.M., eds. *New directions in urban-rural migration: the population turnaround in nonmetropolitan America*. New York: Academic Press: 163–183.

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